

REMARKS

Claims 1, 5, and 6 have been amended, and claim 11 has been cancelled. Accordingly, claims 1-10, and 12-14 remain pending.

The Examiner has objected to the specification with respect to a number of typographical errors, which have been corrected herein.

The drawings have been objected to as failing to comply with 37 C.F.R. 1.84(p)(5) because they do not include a reference symbol T2 for Fig. 2a as mentioned in the specification. A replacement sheet for Fig. 2a has been provided.

The drawings and specification are object to as failing to comply with 37 C.F.R. 1.84(p)(5) because the reference characters that are not mentioned in the description. Replacement sheets for Figs. 3b, 5a, 7, and 11f, on which the reference symbols, noted by the Examiner, have been removed, are herein provided. However, it is noted that the reference symbol 524 for Fig. 5a appears in the specification on page 42, line 1 and such reference symbol remains on Fig. 5a. It is respectfully submitted that the drawings now comply with 37 C.F.R. 1.84(p)(5).

The Examiner rejected claims 1-14 under 35 U.S.C. §101 as being directed towards non - statutory subject matter. Specifically, the Examiner asserts that the step determining overlay error using a scatterometry technique is an abstraction without tangible result. Claim 1 has been amended to recite “determining and storing, in memory, an overlay error...” to overcome this subject matter rejection. It is respectfully submitted that an overlay error value is a tangible result that could be used for any number of practical purposes, such as correction of lithographic process and/or tool. Accordingly, it is submitted that the pending claims comply with 35 U.S.C. §101.

The Examiner rejected claims 1, 5, 6, and 12-13 under 35 U.S.C. §102(e) as being anticipated by Sezginer (U.S. Patent Application 2005/0122516). The Examiner’s rejections are respectfully traversed as follows.

Claim 1 is directed towards a method of determining an overlay error. Claim 1 also recites “for each of a plurality of periodic targets target that each have a first structure formed from a first layer and a second structure formed from a second layer of the sample, measuring a plurality of optical signals at a plurality of incident angles, wherein there are predefined offsets between the first and second structures.” Claim 1 further recites “determining and storing, in memory, an overlay error between the first and second structures by analyzing the measured

optical signals at the plurality of incident angles from the periodic targets using a scatterometry overlay technique based on the predefined offsets without using a calibration operation or a model-based regression technique.” The limitation of claim 11, which the Examiner has deemed allowable, has also been added to claim 1. However, it is respectfully submitted that claim 1 is allowable for other reasons, as well.

The primary reference Sezginer is directed towards using optical signals measured from an overlay grating target to determine overlay. However, Sezginer determines overlay based on a model-based regression technique. See Paragraph [0059]: “A model-based regression(inversion) is then performed to jointly determine the physical properties of the test patterns.” Also see paragraphs [0062]-[0063]. Thus, Sezginer fails to teach or suggest determining and storing an overlay error between two structures by analyzing measured optical signals without using a model-based regression operation, in the manner claimed.

For the forgoing reasons, it is respectfully submitted that claim 1 is patentable over the cited art.

The Examiner’s rejections of the dependent claims are also respectfully traversed. However, to expedite prosecution, all of these claims will not be argued separately. Claims 2-10 and 12-14 each depend directly or indirectly from independent claim 1, therefore, are respectfully submitted to be patentable over cited art for at least the reasons set forth above with respect to claim 1. Further, the dependent claims require additional elements that when considered in context of the claimed inventions further patentably distinguish the invention from the cited art. For example, claim 5 recites “comparing the measured optical signals to theoretical data, using a model-based regression technique, to thereby determine and store, in memory, a second overlay error between the first and second structures” and claim 6 recites “comparing the first overlay error to the second overlay error to thereby adjust the model used to generate the theoretical data.” Sezginer fail to teach utilizing a first scatterometry technique to determine overlay without use of a regression model-based technique, and then using this overlay to adjust a model, in the manner claimed.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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